

Instant Wireless™ Series

Presentation Player



Use this guide to install:

WPG12

User Guide

 **LINKSYS**®

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This Instant Wireless™ Presentation Player has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

FCC Radiation Exposure Statement

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This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

The use of this device in a system operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations.

EC DECLARATION OF CONFORMITY (EUROPE)

Linksys Group declares that the Instant Wireless™ Series products included in the Instant Wireless™ Series conform to the specifications listed below, following the provisions of the EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC:

ETS 300-826, 301 489-1 General EMC requirements for Radio equipment.

EN 609 50 Safety

ETS 300-328-2 Technical requirements for Radio equipment.

Note: This equipment is intended to be used in all EU and EFTA countries. Outdoor use may be restricted to certain frequencies and/or may require a license for operation. For more details, contact Linksys Corporate Compliance.

Note: Combinations of power levels and antennas resulting in a radiated power level of above 100 mW are considered as not compliant with the above mentioned directive and are not allowed for use within the European community and countries that have adopted the European R&TTE directive 1999/5/EC and/or the CEPT recommendation Rec 70.03. For more details on legal combinations of power levels and antennas, contact Linksys Corporate Compliance.

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Linksys Group™ déclare que la carte PC Instant Wireless IEEE 802.11 est conforme aux conditions essentielles et aux dispositions relatives à la directive 1999/5/EC, la directive 89/336/EEC, et à la directive 73/23/EEC.

Belgique B L'utilisation en extérieur est autorisé sur le canal 11 (2462 MHz), 12 (2467 MHz), et 13 (2472 MHz).

Dans le cas d'une utilisation privée, à l'extérieur d'un bâtiment, au-dessus d'un espace public, aucun enregistrement n'est nécessaire pour une distance de moins de 300m. Pour une distance supérieure à 300m un enregistrement auprès de l'IBPT est requise. Pour une utilisation publique à l'extérieur de bâtiments, une licence de l'IBPT est requise. Pour les enregistrements et licences, veuillez contacter l'IBPT.

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Deutschland D: Anmeldung im Outdoor-Bereich notwendig, aber nicht genehmigungspflichtig. Bitte mit Händler die Vorgehensweise abstimmen.

Germany D: License required for outdoor installations. Check with reseller for procedure to follow

Italia I: E' necessaria la concessione ministeriale anche per l'uso interno. Verificare con i rivenditori la procedura da seguire. L'uso per installazione in esterni non e' permessa.

Italy I: License required for indoor use. Use with outdoor installations not allowed.

the Netherlands NL License required for outdoor installations. Check with reseller for procedure to follow.

Nederlands NL Licentie verplicht voor gebruik met buitenantennes. Neem contact op met verkoper voor juiste procedure

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Chapter 1: Introduction

The Linksys Presentation Player

Whether you're giving presentations in the conference room or the board room, the Instant Wireless™ Presentation Player brings you the convenience and reliability of wireless networking! Not only are wires no longer a problem but neither is location. Connect to the Instant Wireless™ Presentation Player from your wireless laptop via Infrastructure mode or from any 802.11b wireless PC that's in line of sight via Infrastructure mode, making multimedia easier than it's ever been before!

The Instant Wireless™ Presentation Player can be placed within your conference room or anywhere near the projector. A high-powered, built-in antenna means that you're ready to present from anywhere within line of sight, eliminating the need for cumbersome cables. So, you've got the flexibility and performance you need to make great presentations combined with the ease of wireless networking as only Linksys can provide.

Features

- Multiple presentation options - remote control, upload presentation, wired or wireless
- Support for display resolutions up to 1024 x 768 with 24-bit color
- Built-in 802.11b wireless access point
- Easy configuration (Setup Wizard or web-based utility)
- 32Mb non-volatile RAM allows presentations to be saved directly to the Presentation Player
- Up to 128-bit WEP with Passphrase
- Infrared remote control with built-in laser pointer
- RF Output 16dBm (40mW)
- Free Technical Support—24 Hours a Day, 7 Days a Week, Toll-Free US Calls
- 1-Year Limited Warranty

Package Contents



Figure 1-1

- One Instant Wireless™ Presentation Player
- Two Removable Antennas
- One Power Adapter
- One Remote Control with Built-in Laser Pointer (two AAA batteries included)
- One Setup CD-ROM with User Guide
- Registration Card and Quick Installation (not shown)

Minimum Requirements

- One 200 MHz PC Running Windows 98, Me, 2000 or XP
- One CD-ROM Drive
- 128 Mb Ram
- 802.11b Wireless Adapter or Ethernet Connection (for remote presentations)
- Microsoft PowerPoint (needed to Upload presentations to the Presentation Player)

Chapter 2: Getting to Know the Presentation Player

The Presentation Player's Ports



Figure 2-1

- | | |
|-----------------------------|---|
| DC-IN | This is the jack where you will connect your power adapter. |
| Power Switch | This switch is used for turning the Player on and off. |
| TO Monitor/Projector | At this port, you will connect the VGA cable from the monitor or projector where your presentation will be displayed. |
| Reset | To reset the Presentation Player to its factory default settings, hold the Reset button in for about ten seconds. |
| LAN | This is where you will connect the Category 5 Ethernet network cable from your PC's Ethernet adapter. |

The Presentation Player's LEDs



Figure 2-2

Power	<i>Red.</i> The Power LED will light up when the Presentation Player is powered on.
WLAN Act	<i>Green.</i> The WLAN Act LED blinks when the Presentation Player is active.
WLAN Link	<i>Yellow.</i> The WLAN Link LED indicates the status of the wireless link. The WLAN Link LED will be lit steadily when the Presentation Player is connected to the wireless network.
LAN Act	<i>Green.</i> The LAN Act LED blinks when the Presentation Player is active.
LAN Link	<i>Yellow.</i> The LAN Link LED indicates the status of the wired link. The LAN Link LED will be lit steadily when the Presentation Player is connected to the wired network.

The Remote Control's Buttons



Figure 2-2

Stop	Use to stop your presentation or connection.
Play	Use to start your presentation from the Presentation List.
Pointer	Use for the laser pointer.
Connect	Use to connect a new user to the Player while in the Presentation List.
List	Takes you to the Presentation List.
Home	Takes you to the Home page.
Info	Shows the system information for the Player: the identification, network settings, and wireless LAN configuration.
User	Shows a list of the connected remote users by using the names of their computers.

Back	Goes back to the previous slide.
Center Round Button	Use like a mouse pad to move the cursor on the screen.
Left and Right Buttons	Use like left and right mouse buttons. Also acts as Next and Previous slide buttons when in the Presentation List.
Delete	Only way to delete your presentation from the Player.
Left and Right Arrows	Use to navigate left and right when in the Presentation List.
Up and Down Arrows	Use to navigate up and down.
Mode	Toggles between high and low resolutions.

Chapter 3: Connecting the Presentation Player

1. Connect the VGA cable from your monitor or projector to the Presentation Player's "TO Monitor/Projector" port.



Figure 3-1

2. Make sure that the Presentation Player is turned off. Plug the supplied power adapter into the jack on the Presentation Player's back panel. Then, plug the other end into a power outlet (surge protection recommended). Turn on the Presentation Player. Only use the power adapter supplied with the Presentation Player. Use of a different adapter can result in product damage.



Figure 3-2

- To have a wired connection, connect one end of the Category 5 Ethernet network cable to your PC's Ethernet adapter. Connect the other end to the Ethernet port on the back of the Presentation Player.



Figure 3-3

- Place the Player near the monitor or projector facing the presenters so the infra red in the remote control will have access to the Player.
- For a wireless connection, fix the direction of the antennas. Try to place it in a position which can best cover your wireless network. Normally, the higher you place the antenna, the better the wireless performance will be. The antenna's position enhances the receiving sensitivity. Both antennas should be perpendicular to the ground and parallel to each other.

Chapter 4: Installing The Presentation Player's Setup Utility

Overview

The Presentation Player can play from any PC in your wireless network. You will need to install this utility in each PC that will be used with the Presentation Player – once installed, it will not need to be done again.

- Insert the Setup CD-ROM into your CD-ROM drive. The CD's InstallShield Wizard should start automatically. If it does not start automatically, click the **Start** button, select **Run**, and type **d:\setup.exe** (where “d” is the letter of your CD-ROM drive) in the Open field to start the autorun program.
- The Welcome page for the Setup Utility will appear (as shown in Figure 4-1). Click the **Install** tab to start the installation procedure and place the Setup Utility on your current PC. Click **Uninstall** to begin a simple procedure for removing the Setup Utility. Click the **User Guide** tab to use this User Guide. If you need to contact Linksys for technical support, click the **Contact Us** tab for that information. Click the **Exit** tab to close the Setup Utility.



Figure 4-1



Note: If you click **Cancel** at any time, you will have to re-start the installation procedure.

Installation

- Click the **Install** tab and the InstallShield Wizard will begin the installation procedure, bringing up a screen like that shown in Figure 4-2. Click the **Next** button to continue the installation procedure.

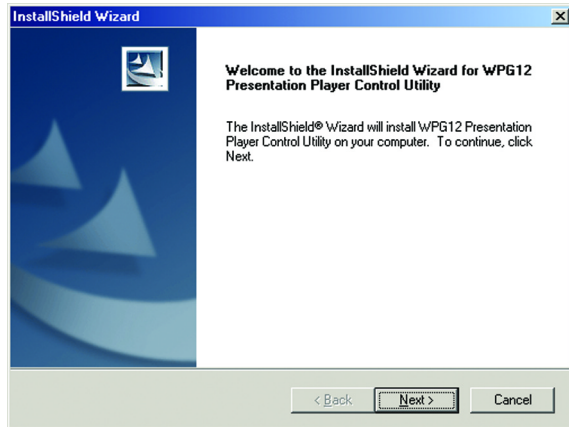


Figure 4-2

- The next screen is the Warranty Policy (as shown in Figure 4-3.) Please read the entire policy. Press your **Page Down** key to view the end of the policy.

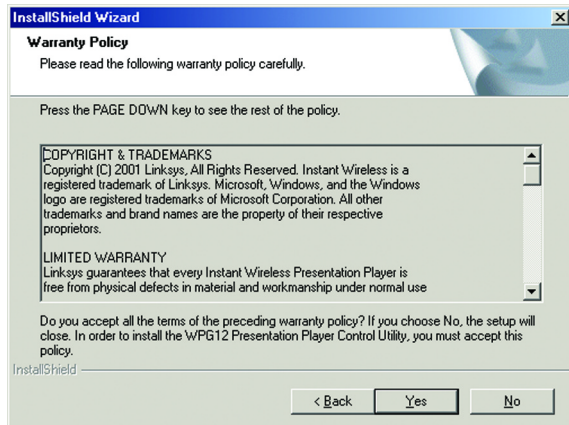


Figure 4-3

To accept the terms of the policy and continue with the installation, click the **Yes** button. If you click the **No** button, the installation will end.

Presentation Player

- The next screen, like that shown in Figure 4-4, will allow you to choose where the Setup Utility will be installed. By default, the destination folder is C:\Program Files\WPG12 Presentation Player.

If you want to change the location, click the **Browse** button and select another destination where it will be installed. Click the **Next** button to continue.

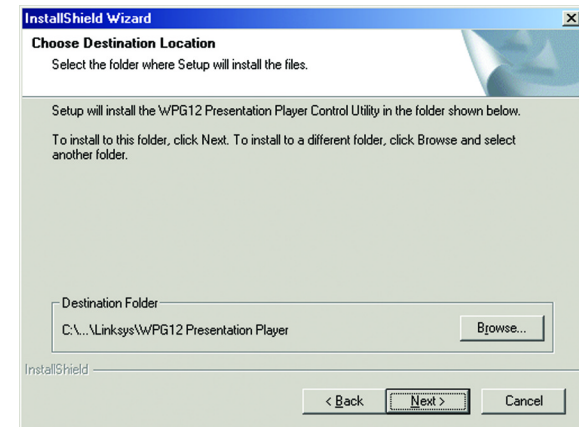


Figure 4-4

- The InstallShield Wizard will now be ready to begin copying the program files. Review the screen shown in Figure 4-5. Click the **Next** button to continue. Click **Back** if you want to change your settings.

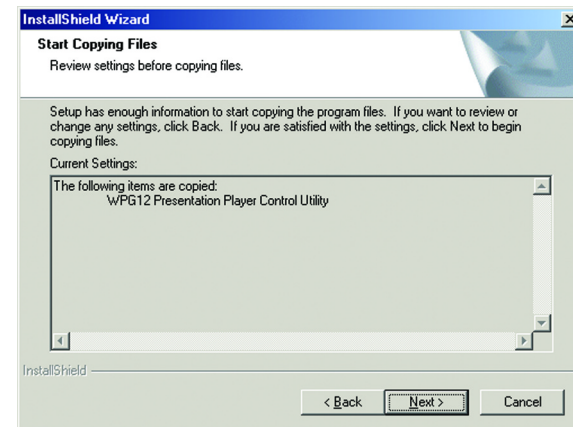


Figure 4-5

7. When you see this screen, the installation of the Setup Utility onto your computer has been completed.

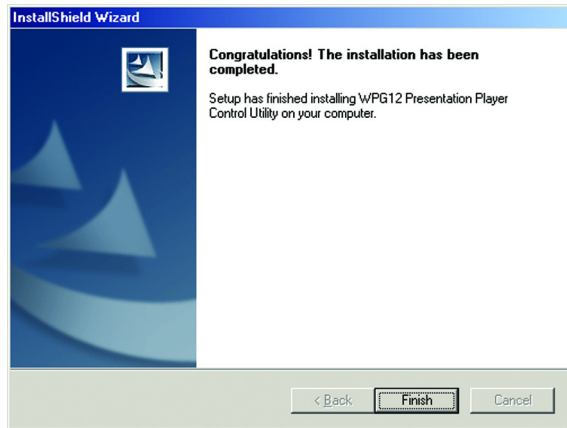


Figure 4-6

Chapter 5: Using The Presentation Player's Web-based Utility

The Presentation Player has been designed to function with the default settings in the Setup Utility. However, if you'd like to change these settings, the Presentation Player can be configured through your web browser with the Web-Based Utility. This chapter explains how to configure the Presentation Player in this manner.

To access the Web-based Utility, you will need the Presentation Player's IP Address. To find the Player's IP Address, make sure that the Presentation Player is connected to the projector or monitor and that both devices are powered on. The IP Address will be visible on the Home page, which is the first screen that appears. Open your web browser and enter the Player's IP Address in the *Address* box. Press the **Enter** key and the following screen, shown in Figure 5-1, will appear.

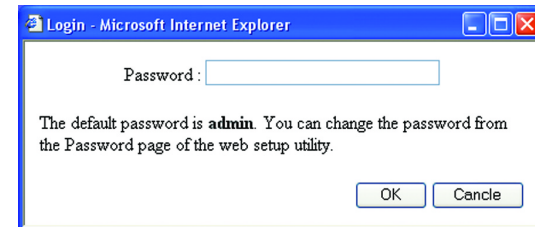


Figure 5-1

1. The first time you open the Web-Based Utility, enter the default password **admin** into the *Password* field. Click the **OK** button. You can later set a new password using the Password tab, as shown in Figure 5-4.

2. The *Setup* tab, as shown in Figure 5-2, has your available basic setup functions. Most users can use the default settings, but you can change them here if you want. Your wireless security functions are located here.

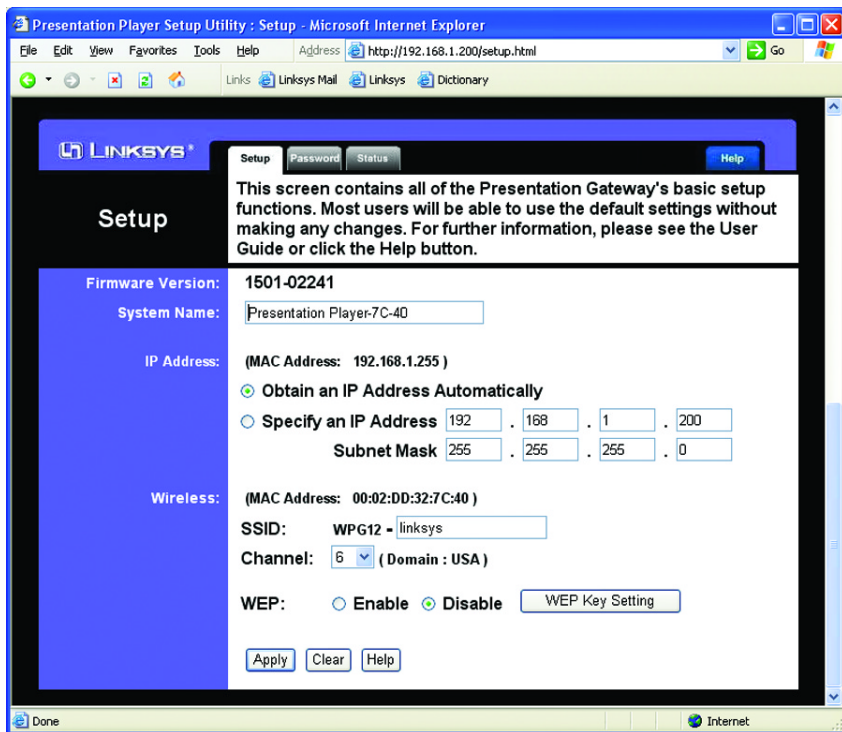


Figure 5-2

Firmware Version - This field displays the current firmware version of the Presentation Player. Firmware upgrades, when available, may be downloaded from the Linksys web site at no charge. If you are not experiencing any problems with the Presentation Player, you should not upgrade the firmware. Make sure to review the release notes of any firmware version before attempting an upgrade.

System Name - This is a common name that you assign to the Presentation Player. This field is limited to 32 characters. By default, four alphanumeric characters follow the device name. These represent the last four characters of the Presentation Player's MAC (Ethernet) address. The MAC address is printed on the bottom of the Presentation Player. Assigning unique and memorable names is helpful, especially if you are employing multiple Presentation devices on the same network.

IP Address - This is the Internet Protocol Address that is assigned to the Presentation Player. Click **Obtain an IP Address Automatically** or **Specify an IP Address**. Choose **Obtain an IP Address Automatically** to allow your Presentation Player to automatically obtain a dynamic IP address from a DHCP server. Or, choose **Specify an IP Address** where you will assign all the devices a permanent IP Address and enter the fixed IP address in the fields provided. Then, enter the **Subnet Mask** into the fields provided. No DHCP changes will take effect until the Presentation Player has been powered down and powered up again. The IP Address will only be used to remotely configure or control the Presentation Player. You need not reconfigure it if you are traveling to remote locations and plan to use the handheld remote control.

Wireless - This section contains all of your wireless settings.

- **SSID** - This stands for Service Set Identifier. The SSID, also called the Network Name, is a unique name that identifies a wireless network. In order to connect to the Presentation Player, all of your wireless computer's settings must be identical to the SSID you define here. The SSID is case sensitive, must not exceed 30 characters, including WPG12-, but may consist of any keyboard character. Make sure this setting is the same for all wireless nodes communicating with the Presentation Player. You should change the default SSID of "linksys" to a name unique to your network.



Note: WPG12- is a permanent part of the SSID for this device. You may enter any characters following WPG12-, but wireless PCs must have the full SSID, including WPG12-, to communicate with the Presentation Player. In most cases, the Control Utility will configure this setting for you.

- **Channel** - Each Access Point and/or Presentation Player on your network should be assigned a unique channel. The channel is a common number that sets the actual frequency this particular device will use to communicate with wireless clients. For example, TV and Radio Stations refer to particular channels, which are actually frequencies at which radio waves are transmitted.

If you experience poor performance, you may be encountering interference from another wireless device. Try changing the channel, as this may eliminate interference and increase performance. Channels 1, 6 and 11 are preferred.

- **WEP** - An acronym for Wired Equivalent Privacy, WEP is an encryption method used to protect your wireless communications and prevent unauthorized access to the Presentation Player and/or your network.

In order to utilize WEP encryption, click the radio button next to **Enable**. Next, click the **WEP Key Setting** button to further define your encryption settings, shown in Figure 5-3. All wireless devices communicating with the Presentation Player must use the same WEP encryption settings. When WEP is enabled, there will be a slight degradation in performance when presenting from a remote wireless computer.



Figure 5-3

- **WEP Encryption** - Select **64 Bit** or **128 Bit**. Selecting the higher wireless security of 128 Bit could slow your presentation.
- **Passphrase** - There are two ways to create **WEP Encryption** keys. The first method is to enter a **Passphrase** with a maximum of 16 Hexadecimal characters (letters “A”-“F” and the numbers “0”-“9”) and click the **Generate** button. This will generate WEP Encryption keys based upon that passphrase. A second method is to manually enter a 10-digit key for 64-bit or a 26-digit key for 128-bit WEP Encryption into the field for **Key 1**. Click the **Apply** button. Click the **Clear** button to erase anything you have entered in error. Click the **Close** button to close the screen.

3. The *Password* tab, as shown in Figure 5-4, is where you change your password and restore the factory default settings for the Presentation Player.

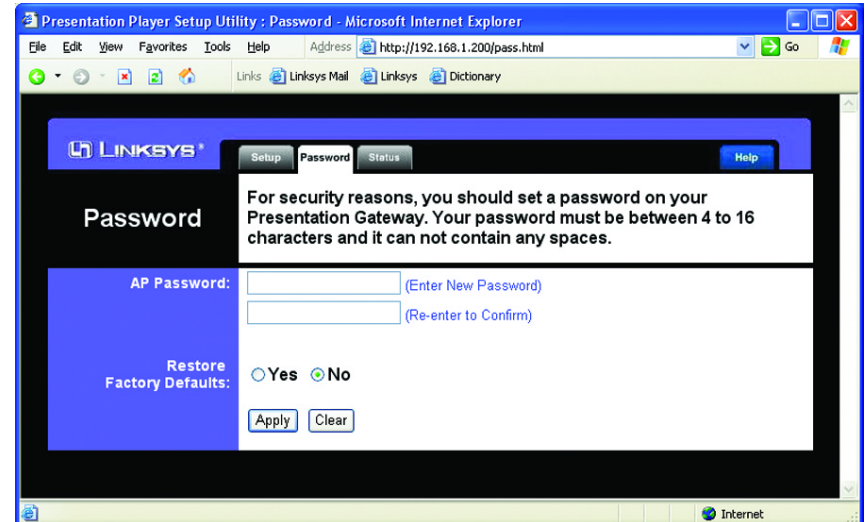


Figure 5-4

Choose an alphanumeric password between 4 and 16 characters and without spaces. Enter the password into the **Enter New Password** field, then repeat it in the **Re-enter to Confirm** field.

To clear all of the settings on the Presentation Player and restore them to the factory default settings, click the **Yes** button.

Click the **Apply** button.

4. The *Status* tab will display the Presentation Player's current settings and activity. It will list your Current IP Address, Subnet Mask, and Gateway. The LAN Transfer, LAN Receive, WLAN Transfer, and WLAN Receive entries display your network's performance levels.

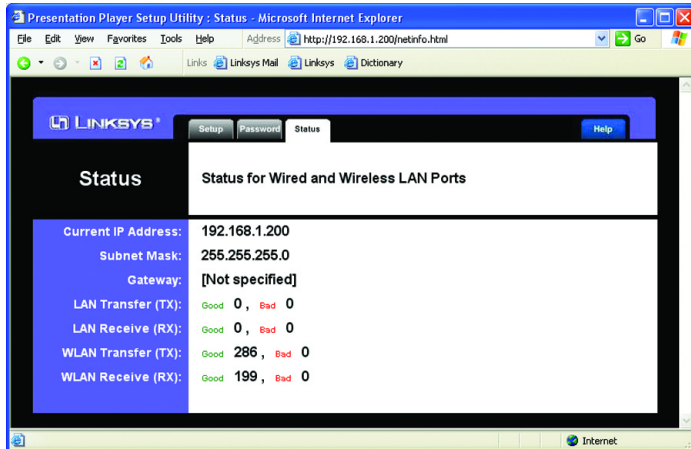


Figure 5-5

5. The *Help* tab (see Figure 5-6) has links to the Presentation Player's support documentation, including the application that upgrades the firmware.

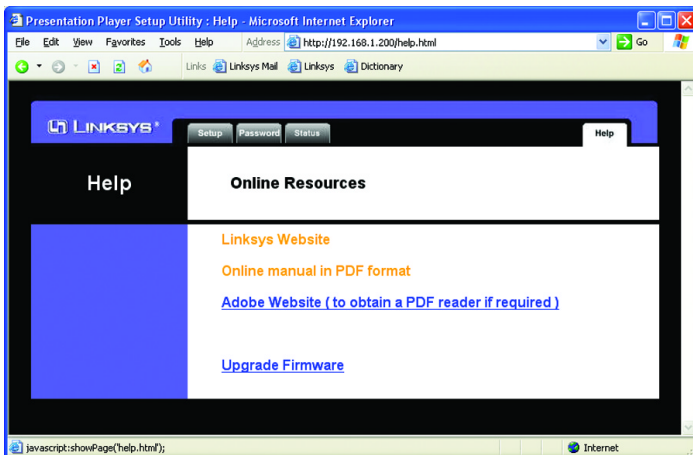


Figure 5-6

New firmware versions are posted at the Linksys website and can be downloaded for free. After you download the new firmware, click the **Upgrade Firmware** link. Enter the **Password**, then enter the location of the file in the **File Path** or click the **Browse** button to find the file. Click the **Upgrade** button to upgrade the firmware.

Chapter 6: Using The Control Utility of the Presentation Player

The control utility may be used from any wired or wireless notebook or desktop PC with a connection to the Wireless Presentation Player. It is a good idea to place the Wireless Presentation Player on or near the monitor or projection area. The Infrared sensor is located on the front panel of the unit and the remote control must be in line-of-sight in order to function properly.

Make sure that the Presentation Player is connected to the projector or monitor and that both devices are powered on. Click on the **Presentation Player Control Utility** button on the screen that appears.

1. The welcome screen will appear first. Click **Next**.

If the screen in Figure 6-2 appears, try these steps:

1. Turn off the Presentation Player and projector, then turn them back on.
2. Click the Search Again button. Try this at least three times.
3. If the Presentation Player still cannot be found, continue to steps 4 and 5.
4. The Presentation Player settings will appear at the bottom of the projector screen.
5. Manually enter the proper IP address, subnet mask, SSID, and channel information to the wireless adapter in your notebook or desktop.



Figure 6-1



Figure 6-2

2. When the Presentation Player is found, this screen in Figure 6-3 will appear. Select your Presentation Player from the drop-down menu and click the **Next** button. If the Player cannot be found, refer to Appendix A: Troubleshooting.



Figure 6-3

3. When you see the screen shown in Figure 6-4, you will choose a color setting. Select the default **True Color** to have the optimum color option. If the action is very slow or your presentation is mostly text, you may want to select **Basic Color**. You will still have color and your speed will increase.



Figure 6-4

Refresh! - Click this button if you need to search for the Player.

Next, choose your presentation option from the following buttons at the bottom of the screen.

- **Upload Presentation** - This option allows you to upload a PowerPoint presentation to the Presentation Player. Once uploaded, you can display the entire presentation using the hand-held remote control. While this feature allows great freedom and mobility, please consider the following when uploading a presentation to the Presentation Player:
 - ◆ Once uploaded, anyone can use the remote control to view the presentation on a monitor, so take precautions if your presentation contains sensitive or confidential material.
 - ◆ The PC attempting to upload a presentation must have Microsoft PowerPoint 97 or later installed.
 - ◆ Some features, such as animation, hyperlinks, and sound will not be available once your presentation is uploaded.
 - ◆ The Presentation Player comes with 32Mb of storage for your presentations. This should allow enough room for users to store several presentations. However, be sure to remove your presentations when they are no longer needed to make room for newer files.
- **Take Control of the Presentation Player** - This feature allows you to conveniently transfer the contents of your local PC screen to the projector or monitor that is connected to the Player where the presentation will be displayed. You may notice some delay in mouse and keyboard function. Such a delay is normal for this mode of operation. Only one user at a time can control the Presentation Player. The supported display resolutions are 800 x 600 or 1024 x 768. Please see your Windows documentation for more information on changing your display settings.
- **Give Control to Another User (Pause)** - To pause your presentation or change presenters, click this button.
- **Exit (Stop)** - To exit the Control utility, click this button.

If you have minimized the Control Utility during your presentation, you can quickly restore it by double-clicking the Control Utility icon on your Windows Status bar that is near the clock.

4. If you click the **Upload Presentation** button, the screen in Figure 6-5 will appear. Click the **Browse** button to search for your file.



Figure 6-5

The screen in Figure 6-6 will appear. After you find your presentation, select it, then click the **Open** button. After you click the Open button, your file will appear in the *Browse* field of Figure 5-5. Click **Upload**. Your file will be automatically converted and loaded onto the Presentation Player.

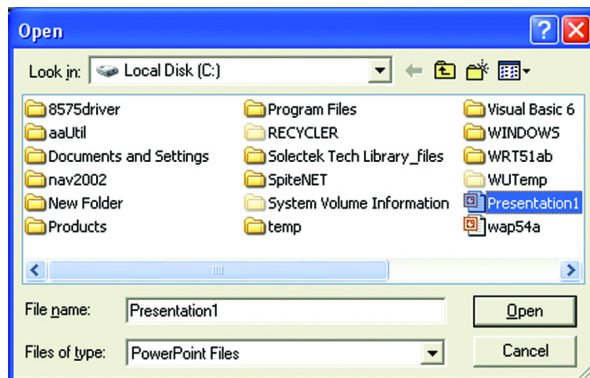


Figure 6-6

5. The screen shown in Figure 6-7 will appear next if you have WEP enabled on the Presentation Player. This screen allows you to set the security for your wireless client. You will need to set the identical security settings that you used for the Presentation Player in “Chapter 5: Using the Presentation Player’s Web-based Utility.”

Select the level of Encryption used for the Player. Select **64 Bits** or **128 Bits** in the drop-down box for *Encryption*.

Enter the **Passphrase** used for the Player into the field for *Passphrase*. A key will automatically populate the Key field. Or, if manually entered for the Player, you can manually enter the **10-digit key** for 64-bit or a **26-digit key** for 128-bit WEP Encryption into the field for *Key*.



Figure 6-7

Click the **Next** button.

Chapter 7: Using the Remote Display Presentation Function

The Presentation Player has a built-in image viewer and internal storage, so you can give a presentation without an attached PC. All you need to do is load the presentation files onto the system in advance, then you can deliver a presentation using the remote control. The Player also has the remote display function to switch users during a presentation.

1. To load your presentation, go to the Upload Presentation Section of Chapter 5: Using the Presentation Player's Web-Based Utility. To learn about the Remote Control, go to The Remote Control's Buttons in Chapter 2.
2. Make sure that the Presentation Player is connected to the projector or monitor and that both devices are powered on. The screen in Figure 7-1 will appear. It is referred to as the Home page. If you click on a screen's **Home** button, you will return here.



Figure 7-1

The three buttons on this screen are described below and in the following paragraphs.

- Remote Users** - Click this button to view and connect to the remote users.
- Presentation List** - Click this button to view the list of loaded presentations.
- System Info** - Click this button to view the Player's identification, network settings, and wireless LAN configuration.

Remote Users

If you click on the **Remoter Users** button from Figure 7-1, you will see the screen in Figure 7-2. It will list the remote users who are connected to the Player showing a presentation from the desktop of their PC.

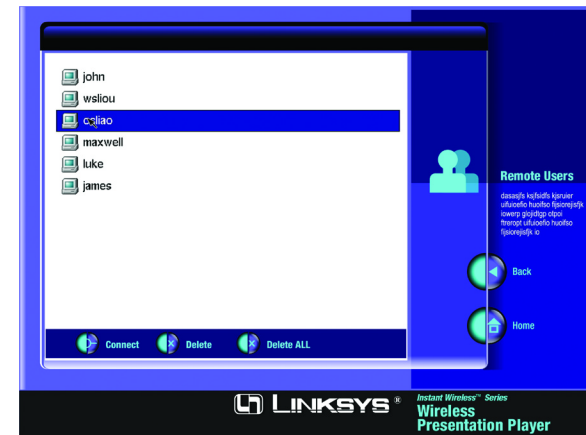


Figure 7-2

- Connect** - Click this button after using the mousepad to select the user who wants to connect and give their presentation.
- Delete** - Click this button after selecting the user you want to remove from the list.
- Delete All** - Click this button to delete all the users.
- Back** - Click this button to go back to the previous screen.
- Home** - Click this button to go the the Home page.

Presentation List

If you click the **Presentation List** button from Figure 7-1, or the List button on the remote control, you will see the screen shown in Figure 7-3. You can view the presentation files that are loaded onto the Player. They are listed in folders that match the name of the user's computer.

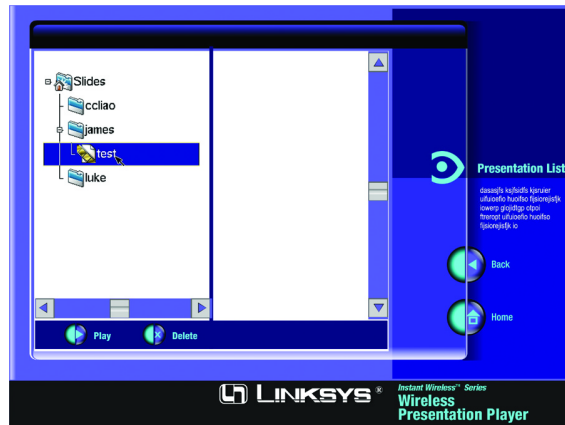


Figure 7-3

Play - Click this button after selecting a presentation file to start the presentation.

Delete - Click this button after selecting a presentation file you want to delete from the list.

Back - Click this button to go back to the previous screen.

Home - Click this button to go to the Home page.

System Info

If you click the **System Info** button from Figure 7-1, you will see a screen like that shown in Figure 7-4. You can view the Player's system information, including identification, network settings, and wireless LAN configuration.

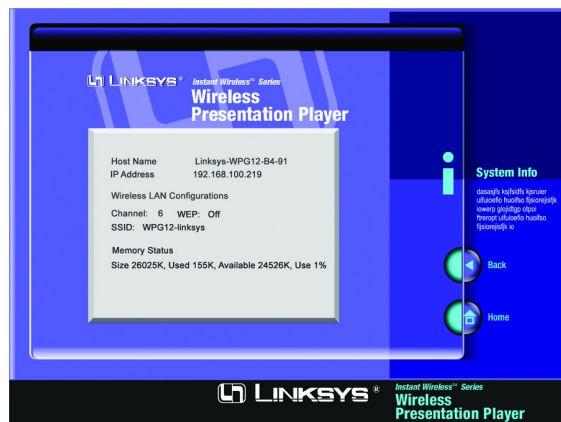


Figure 7-4

Back - Click this button to go back to the previous screen.

Home - Click this button to go to the Home page.

Appendix A: Troubleshooting

This section provides possible solutions to problems regarding the installation and operation of the Presentation Player. If you can't find an answer here, check the Linksys website at www.linksys.com.

Can I run an application from a remote computer over the wireless network?

This will depend on whether or not the application is designed to be used over a network. Consult the application's user guide to determine if it supports operation over a network.

Can I use the Presentation Player with non-Linksys wireless equipment?

Yes, as long as you use it with wireless equipment that complies with the IEEE 802.11b standard.

What is the IEEE 802.11b standard?

It is the IEEE standard for wireless networks. This standard allows wireless LAN hardware from different manufacturers to communicate.

What IEEE 802.11b features are supported?

The product supports the following IEEE 802.11 functions:

- CSMA/CA plus Acknowledge protocol
- Multi-Channel Roaming
- Automatic Rate Selection
- RTS/CTS feature
- Fragmentation
- Power Management

The Presentation Player's Control Utility cannot detect the Presentation Player.

Verify that the Presentation Player's power is on and all of your wireless equipment complies with the 802.11B standard and that you are correctly connected to the Player with a Category 5 Ethernet network cable.

What is Ad-hoc?

An Ad-hoc wireless LAN is a group of computers, each with a WLAN adapter, connected as an independent wireless LAN. An Ad-hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

What is Infrastructure?

An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to a central database, or wireless application for mobile workers.

What is Roaming?

Roaming is the ability of a portable computer user to communicate continuously while moving freely throughout an area greater than that covered by a single Wireless Network Access Point. Before using the roaming function, the workstation must make sure that it is the same channel number as the Wireless Network Access Point of the dedicated coverage area.

To achieve true seamless connectivity, the wireless LAN must incorporate a number of different functions. Each node and Wireless Network Access Point, for example, must always acknowledge receipt of each message. Each node must maintain contact with the wireless network even when not actually transmitting data. Achieving these functions simultaneously requires a dynamic RF networking technology that links Wireless Network Access Points and nodes. In such a system, the user's end node undertakes a search for the best possible access to the system. First, it evaluates such factors as signal strength and quality, as well as the message load currently being carried by each Wireless Network Access Point and the distance of each Wireless Network Access Point to the wired backbone. Based on that information, the node next selects the right Wireless Network Access Point and registers its address. Communications between end node and host computer can then be transmitted up and down the backbone.

As the user moves on, the end node's RF transmitter regularly checks the system to determine whether it is in touch with the original Wireless Network Access Point or whether it should seek a new one. When a node no longer receives acknowledgment from its original Wireless Network Access Point, it undertakes a new search. Upon finding a new Wireless Network Access Point, it then re-registers, and the communication process continues.

What is a BSS ID?

A specific Ad-hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSS ID.

What is an ESS ID?

An Infrastructure configuration could also support roaming capability for mobile workers. More than one BSS can be configured as an Extended Service Set (ESS). Users within an ESS could roam freely between BSSs while maintaining a continuous connection to the wireless network stations and Wireless Network Access Points.

What is ISM band?

The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high speed wireless capabilities in the hands of users around the globe.

What is Spread Spectrum?

Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communications systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade-off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not tuned to the right frequency, a spread-spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS).

What is DSSS? What is FHSS? And what are their differences?

Frequency Hopping Spread Spectrum (FHSS) uses a narrowband carrier that changes frequency in a pattern that is known to both transmitter and receiver. Properly synchronized, the net effect is to maintain a single logical channel. To an unintended receiver, FHSS appears to be short-duration impulse noise. Direct Sequence Spread Spectrum (DSSS) generates a redundant bit pattern for each bit to be transmitted. This bit pattern is called a chip (or chipping code). The longer the chip, the greater the probability that the original data can be recovered. Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the radio can recover the original data without the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers.

Would the information be intercepted while transmitting on air?

WLAN features two-fold protection in security. On the hardware side, as with Direct Sequence Spread Spectrum technology, it has the inherent security feature of scrambling. On the software side, the WLAN series offers the encryption function (WEP) to enhance security and access control. Users can set it up depending upon their needs.

Can Instant Wireless products support file and printer sharing?

Instant Wireless products perform the same function as LAN products. Therefore, Instant Wireless products can work with NetWare, Windows NT/2000, or other LAN operating systems to support printer or file sharing.

I am using 802.11b-compliant wireless equipment but still cannot connect to my wireless network.

Verify that you are using the same IP domain as that of your wireless network.

Appendix B: Planning Your Wireless Network

Network Topology

A wireless LAN is exactly like a regular LAN, except that each network device in the LAN uses wireless technology to connect to the network. Computers in a wireless LAN must be configured to share the same radio channel.

Wireless components provides LAN access for wireless network devices. An integrated wireless and wired LAN is called an Infrastructure configuration. A group of wireless users and an access point compose a Basic Service Set (BSS). Each PC equipped with a wireless adapter in a BSS can talk to any computer in a wired LAN infrastructure.

An infrastructure configuration extends the accessibility of a wireless user to a wired LAN, and doubles the effective wireless transmission range for wireless PCs. Since the access point is able to forward data within its BSS, the effective transmission range in an infrastructure LAN is doubled.

The use of a unique ID in a Basic Service Set is essential.

The Wireless LAN Infrastructure configuration is appropriate for enterprise-scale wireless access to a central database, or as a wireless application for mobile users.

Roaming

Infrastructure mode also supports roaming capabilities for mobile users. More than one BSS can be configured as an Extended Service Set (ESS). This continuous network allows users to roam freely within an ESS. All wireless PCs within one Extended Service Set must be configured with the same SSID.

Selecting a feasible radio channel and optimum access point position is recommended. Proper access point positioning combined with a clear radio signal will greatly enhance performance.

Ad-hoc versus Infrastructure Mode

Unlike wired networks, wireless networks have two different modes in which they may be set up: **Infrastructure** and **Ad-hoc**. Choosing between these two modes depends on whether or not the wireless network needs to share data or peripherals with a wired network or not.

If the computers on the wireless network need to be accessible by a wired network or need to share a peripheral, such as a printer, with the wired network computers, the wireless network should be set up in the Infrastructure mode, as shown in Figure A-1. The basis of Infrastructure mode centers around an access point, which serves as the main point of communications in a wireless network. Access points transmit data to PCs equipped with wireless network card, which can roam within a certain radial range of the access point. Multiple access points can be arranged in succession to extend the roaming range, and can be set up to communicate with your Ethernet hardware as well.



Figure A-1

If the wireless network is relatively small and needs to share resources only with the other computers on the wireless network, then the Ad-hoc mode can be used, as shown in Figure A-2. Ad-hoc mode allows computers equipped with wireless transmitters and receivers to communicate directly with each other, eliminating the need for an access point. The drawback of the Ad-hoc mode is that wireless-equipped computers are not able to communicate with computers on a wired network. In addition, communication between the wire-



Figure A-2

less-equipped computers is limited by the distance and interference directly between them.

Appendix C: Upgrading the Presentation Player's Firmware

The Presentation Player functions with the use of firmware, programming written in the unit's internal memory. It is this firmware that enables the Presentation Player to function and makes it easy to use.

Occasionally, this firmware will be upgraded, which could increase the Presentation Player's stability or make it easier to use. New versions of the firmware can be found on the Linksys web site at www.linksys.com.

To upgrade this firmware, download it from the website and then double-click the file wherever it has been saved. You will be walked through instructions on how to upgrade the firmware.

Appendix D: Glossary

Adapter - Printed circuit board that plugs into a PC to add to capabilities or connectivity to a PC. In a networked environment, a network interface card (NIC) is the typical adapter that allows the PC to connect to the intranet and/or Internet.

Ad-hoc Network - An ad-hoc network is a group of computers, each with a wireless adapter, connected as an independent 802.11 wireless LAN. Ad-hoc wireless computers operate on a peer-to-peer basis, communicating directly with each other without the use of an access point. Ad-hoc mode is also referred to as an Independent Basic Service Set (IBSS) or as peer-to-peer mode, and is useful at a departmental scale or SOHO operation.

Backbone - The part of a network that connects most of the systems and networks together and handles the most data.

Bandwidth - The transmission capacity of a given facility, in terms of how much data the facility can transmit in a fixed amount of time; expressed in bits per second (bps).

Bit - A binary digit. The value - 0 or 1-used in the binary numbering system. Also, the smallest form of data.

BSS (Basic Service Set) - An infrastructure network connecting wireless devices to a wired network using a single access point.

CSMA/CA (Carrier Sense Multiple Access/Collision Avoidance) - In local area networking, this is the CSMA technique that combines slotted time-division multiplexing with carrier sense multiple access/collision detection (CSMA/CD) to avoid having collisions occur a second time.

CTS (Clear To Send) - An RS-232 signal sent from the receiving station to the transmitting station that indicates it is ready to accept data.

Database - A database is a collection of data that is organized so that its contents can easily be accessed, managed, and updated.

Download - To receive a file transmitted over a network. In a communications session, download means receive, upload means transmit.

Driver - A workstation software module that provides an interface between a network interface card and the upper-layer protocol software running in the computer; it is designed for a specific NIC, and is installed during the initial installation of a network-compatible client operating system.

DSSS (Direct-Sequence Spread Spectrum) - DSSS generates a redundant bit pattern for all data transmitted. This bit pattern is called a chip (or chipping code). Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the receiver can recover the original data without the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers. However, to an intended receiver (i.e. another wireless LAN endpoint), the DSSS signal is recognized as the only valid signal, and interference is inherently rejected (ignored).

Encryption - A security method that applies a specific algorithm to data in order to alter the data's appearance and prevent other devices from reading the information.

ESS (Extended Service Set) - A set of more than two or more BSSs (multiple access points) forming a single network.

Ethernet - IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium. Has a transfer rate of 10 Mbps. Forms the underlying transport vehicle used by several upper-level protocols, including TCP/IP and XNS.

FHSS (Frequency Hopping Spread Spectrum) - FHSS continuously changes (hops) the carrier frequency of a conventional carrier several times per second according to a pseudo-random set of channels. Because a fixed frequency is not used, and only the transmitter and receiver know the hop patterns, interception of FHSS is extremely difficult.

Firmware - Code that is written onto read-only memory (ROM) or programmable read-only memory (PROM). Once firmware has been written onto the ROM or PROM, it is retained even when the device is turned off.

Fragmentation - Breaking data into smaller units when transmitting over a network medium that cannot support the original size of the data.

Gateway - A device that interconnects networks with different, incompatible communications protocols.

Hardware - Hardware is the physical aspect of computers, telecommunications, and other information technology devices. The term arose as a way to distinguish the "box" and the electronic circuitry and components of a computer from the program you put in it to make it do things. The program came to be known as the software.

Hop - The link between two network nodes.

IEEE (The Institute of Electrical and Electronics Engineers) - The IEEE describes itself as "the world's largest technical professional society, promoting the development and application of electrotechnology and allied sciences for the benefit of humanity, the advancement of the profession, and the well-being of our members."

The IEEE fosters the development of standards that often become national and international standards. The organization publishes a number of journals, has many local chapters, and several large societies in special areas, such as the IEEE Computer Society.

Infrastructure Network - An infrastructure network is a group of computers or other devices, each with a wireless adapter, connected as an 802.11 wireless LAN. In infrastructure mode, the wireless devices communicate with each other and to a wired network by first going through an access point. An infrastructure wireless network connected to a wired network is referred to as a Basic Service Set (BSS). A set of two or more BSS in a single network is referred to as an Extended Service Set (ESS). Infrastructure mode is useful at a corporation scale, or when it is necessary to connect the wired and wireless networks.

ISM band - The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high-speed wireless capabilities in the hands of users around the globe.

LAN - A local area network (LAN) is a group of computers and associated devices that share a common communications line and typically share the resources of a single processor within a small geographic area (for example, within an office building).

Mbps (MegaBits Per Second) - One million bits per second; unit of measurement for data transmission.

Network - A system that transmits any combination of voice, video and/or data between users.

Node - A network junction or connection point, typically a computer or work station.

Port - A pathway into and out of the computer or a network device. For example, the serial and parallel ports on a personal computer are external sockets for plugging in communications lines, modems and printers.

Roaming - In an infrastructure mode wireless network, this refers to the ability to move out of one access point's range and into another and transparently reassociate and reauthenticate to the new access point. This reassociation and reauthentication should occur without user intervention and ideally without interruption to network connectivity. A typical scenario would be a location with multiple access points, where users can physically relocate from one area to another and easily maintain connectivity.

RTS (Request To Send) - An RS-232 signal sent from the transmitting station to the receiving station requesting permission to transmit.

SOHO (Small Office/Home Office) - Market segment of professionals who work at home or in small offices.

Spread Spectrum - Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communications systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. If a receiver is not tuned to the right frequency, a spread-spectrum signal looks like background noise. There are two main alternatives, Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS).

SSID (Service Set Identifier) - A unique name shared among all points in a wireless network. The SSID must be identical for each point in the wireless network and is case-sensitive. Also known as "ESS ID."

TCP/IP (Transmission Control Protocol/Internet Protocol) - The basic communication language or set of protocols for communications over a network (developed specifically for the Internet). TCP/IP defines a suite or group of protocols and not only TCP and IP.

Topology - A network's topology is a logical characterization of how the devices on the network are connected and the distances between them. The most common network devices include hubs, switches, routers, and gateways. Most large networks contain several levels of interconnection, the most important of which include edge connections, backbone connections, and wide-area connections.

Upgrade - To replace existing software or firmware with a newer version.

Upload - To transmit a file over a network. In a communications session, upload means transmit, download means receive.

WAN (Wide Area Network)- A communications network that covers a relatively large geographic area, consisting of two or more LANs. Broadband communication over the WAN is often through public networks such as the telephone (DSL) or cable systems, or through leased lines or satellites. In its most basic definition, the Internet could be considered a WAN.

WEP (Wired Equivalent Privacy) - A data privacy mechanism based on a 64-bit or 128-bit shared key algorithm, as described in the IEEE 802.11 standard.

WLAN (Wireless Local Area Network) - A group of computers and associated devices that communicate with each other wirelessly.

Workgroup - Two or more individuals that share files and databases.

Appendix E: Specifications

Standard	IEEE 802.11b
Channels	11 Channels (US, Canada) 13 Channels (Europe) 14 Channels (Japan)
Operating Range	Up to 100m (328 ft.)
LEDs	Power, WLAN Act, WLAN Link

Environmental

Dimensions	7.3" x 6.5" x 1.9" (186 mm x 165 mm x 48 mm)
Unit Weight	16 oz. (0.46 kg)
Power	External, 5V AC 2.5A
Certifications	FCC Class B, CE Mark
Operating Temp.	32°F to 131°F (0°C to 55°C)
Storage Temp.	14°F to 149°F (-10°C to 65°C)
Operating Humidity	10% to 90% Non-Condensing
Storage Humidity	10% to 90% Non-Condensing

Appendix F: Warranty Information

BE SURE TO HAVE YOUR PROOF OF PURCHASE AND A BARCODE FROM THE PRODUCT'S PACKAGING ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE.

IN NO EVENT SHALL LINKSYS' LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT, ITS ACCOMPANYING SOFTWARE, OR ITS DOCUMENTATION. LINKSYS DOES NOT OFFER REFUNDS FOR ANY PRODUCT.

LINKSYS OFFERS CROSS SHIPMENTS, A FASTER PROCESS FOR PROCESSING AND RECEIVING YOUR REPLACEMENT. LINKSYS PAYS FOR UPS GROUND ONLY. ALL CUSTOMERS LOCATED OUTSIDE OF THE UNITED STATES OF AMERICA AND CANADA SHALL BE HELD RESPONSIBLE FOR SHIPPING AND HANDLING CHARGES. PLEASE CALL LINKSYS FOR MORE DETAILS.

Appendix G: Contact Information

For help with the installation or operation of this product, contact Linksys Customer Support at one of the phone numbers or Internet addresses below.

Sales Information	800-546-5797 (LINKSYS)
Tech Support	800-326-7114
RMA Issues	949-261-1288
Fax	949-261-8868
Email	support@linksys.com
Web	http://www.linksys.com
FTP Site	ftp.linksys.com



<http://www.linksys.com>

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